BENZOYL CHLORIDE

CAS Registry Number: 98-88-4

Molecular Formula: C_7H_5ClO

Benzoyl chloride is a transparent or colorless liquid with a penetrating odor (HSDB, 1991). It is miscible in ether, carbon disulfide, benzene, and oils, and decomposes in water and alcohol (Merck, 1989). Benzoyl chloride is flammable and will react with water or steam to produce heat and toxic and corrosive fumes. It can have a violent or explosive reaction with dimethyl sulfoxide, aluminum chloride, and naphthalene (Sax, 1989).

Physical Properties of Benzoyl Chloride

Synonyms: benzenecarbonyl chloride; benzoic acid; chloride; alpha-chlorobenzaldehyde

Molecular Weight:	140.57
Boiling Point:	197.2 °C
Melting Point:	-1.0 °C
Flash Point:	88 °C (190.4 °F)
Vapor Density:	4.9 (air = 1)
Vapor Pressure:	1 mm Hg at 32.1 °C
Density/Specific Gravity:	1.2070 at 25/4 °C (water = 1)
Conversion Factor:	1 ppm = 5.75 mg/m^3

(HSDB, 1993; Merck, 1989; Sax, 1989)

SOURCES AND EMISSIONS

A. Sources

Benzoyl chloride is used for acylation, as a reagent in the production of dyes, resins, perfumes, pharmaceuticals, benzoyl peroxide, polymerization catalysts, benzophenone, and stabilizers (HSDB, 1991).

B. Emissions

No emissions of benzoyl chloride from stationary sources in California were reported, based on data obtained from the Air Toxics “Hot Spots” Program (AB 2588) (ARB, 1997b).

C. Natural Occurrence

Benzoyl chloride has not been reported to occur in nature (HSDB, 1993).

AMBIENT CONCENTRATIONS

No Air Resources Board data exist for ambient concentrations of benzoyl chloride.

INDOOR SOURCES AND CONCENTRATIONS

No information about indoor sources and concentrations for benzoyl chloride was found in the readily-available literature.

ATMOSPHERIC PERSISTENCE

In the atmosphere, benzoyl chloride may directly photolyze by reaction with hydroxyl radicals (HSDB, 1993). No information on the atmospheric half-life and lifetime was found in the readily-available literature.

AB 2588 RISK ASSESSMENT INFORMATION

Benzoyl chloride emissions are not reported from stationary sources in California under the AB 2588 program. It is also not listed in the California Air Pollution Control Officers Association Air Toxics "Hot Spots" Program Revised 1992 Risk Assessment Guidelines as having health values (cancer or non-cancer) for use in risk assessments (CAPCOA, 1993).

HEALTH EFFECTS

Probable routes of human exposure to benzoyl chloride are inhalation, ingestion, and dermal contact.

Non-Cancer: Benzoyl chloride is caustic to the skin and mucous membranes and may cause serious injury to the eye. Vapors are expected to be highly irritating to the eyes and respiratory tract. Benzoyl chloride reacts with moisture to give hydrochloric acid and benzoic acid (HSDB, 1995). The United States Environmental Protection Agency (U.S. EPA) has not established a Reference Concentration (RfC) or an oral Reference Dose (RfD) for benzoyl chloride (U.S. EPA, 1995a).

Cancer: The U.S. EPA has not classified benzoyl chloride with respect to potential carcinogenicity (U.S. EPA, 1995a). The International Agency for Research on Cancer has classified benzoyl chloride in Group 3: Not classifiable as to its carcinogenicity in humans (IARC, 1987a).